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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



South Pole Landing

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A SCIENCE SERVICE PUBLICATION

BIOCHEMISTRY

Change Virus Heredity

► **KNOWN GENETIC CHANGES**, or mutations, in the chemical structures of viruses have been induced for the first time by scientists at the University of California.

Moreover, the rate at which these mutations can be induced is the highest ever achieved by any means, and the mutants produce mutant offspring.

The work suggests that scientists may some day be able to treat virus diseases with chemicals that would turn deadly viruses into harmless ones. Viruses now are almost immune to attack by antibiotics and other chemicals.

For the present, however, the Berkeley scientists are concerned solely with the fundamental chemical structure of virus heredity and how hereditary characteristics can be bestowed by making chemical alterations in the agents.

The research has been performed by Miss Rose M. Litman, Abraham Rosenberg Fellow, and Dr. Arthur B. Pardee, assistant professor of biochemistry.

Miss Litman achieved the mutations by altering the fundamental structure of the ribonucleic acid of a virus that attacks bacteria. Ribonucleic acid is an all-important life substance.

Miss Litman actually "fooled" the viruses. She put some sulfanilamide into the virus culture, thus blocking the formation of thymine, normally an essential part of the nucleic acid of the viruses.

She also put into the culture a chemical called 5-bromouracil, which is something like thymine.

When new viruses were formed, there was no thymine for them, but they accepted the 5-bromouracil in its place.

About 10% of offspring were mutants containing this chemical. This is a rate of mutation about 1,000 times larger than occurs normally. The mutant viruses also produce offspring that are mutants.

The work is considered by Dr. Wendell Stanley, director of the Virus Laboratory, to be an important development in studies of genetic change, not only among viruses, but among all living forms.

If it is possible on a planned basis to cause chemical mutations of one virus, he said, then it may be possible for others. Eventually the point might be reached where infectious viruses could be made to produce non-infectious ones, thus halting virus infections in man, animals and plants.

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BIOPHYSICS

Repeated X-ray Doses

► **X-RAYS** in moderate but repeated doses speed the formation of tumors more than a single large dose of equal strength, studies with rats have shown.

This is one of several results noted in studies of effects of total body irradiation of rats at the Atomic Energy Project of the University of California at Los Angeles by Dr. Baldwin Lamson, Dr. Leslie Bennett and Raymond Meek.

It has been shown previously that total body exposure to X-rays can hasten "old age" in rats. The UCLA studies showed that rats surviving whole body irradiation developed characteristics of old age considerably earlier than normal rats.

In addition to a general shortening of the life span, total body irradiation appeared to accelerate formation of tumors that usually occur in rats during old age and to cause diseased kidneys and high blood pressure in the animals.

These effects resulted from sublethal doses repeated at intervals of several months as well as from large single doses equal to the total strength of the moderate ones. The series of sublethal doses accelerated tumor growth more than the large single doses.

Although it has been demonstrated that a lack of oxygen increases chances of survival in irradiated rats, the amount of oxygen available to the animal did not seem to influence the latent effects of X-rays.

The doctors emphasized that the animal studies were only preliminary and that much more work was needed before the findings could be related to effects in man. These doses are very much higher than those used in conventional medical practice, they noted.

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GENERAL SCIENCE

Deny Young Scientists Succumb to Communism

► **SCIENTISTS** and others familiar with the rising generation of scientists are not in agreement with the opinion of District Judge Alexander Holtzoff who stated from the bench that he inferred that "the younger generation of pure scientists specifically engaging in research in physics has succumbed to communistic propaganda."

The records of some 4,500 who have received honors as America's top young scientists in 15 years of the Science Talent Search, for instance, have failed to disclose even one who "has succumbed to communistic propaganda."

Judge Holtzoff made his remarks in the course of imposing a 90-day jail sentence upon Bernard Deutch, 27-year-old graduate student in physics at the University of Pennsylvania, who was convicted of contempt of

Congress after refusing to answer certain questions before the House Un-American Activities Committee.

At least two scientific groups, the Federation of American Scientists and the Philosophical Society of Washington, have sent Judge Holtzoff letters of protest. He has insisted, in return, that he was not accusing a whole group.

Science News Letter, December 29, 1956

BIOLOGY

Tree's Electricity Measured in Storm

► **A TREE'S ELECTRICITY** and how it changes during severe thunderstorms is being measured by Dr. H. S. Burr, Yale University School of Medicine, New Haven, Conn.

He reports "very considerable" variations in the tree's electrical field. These are associated with "very profound changes in earth and atmospheric electricity," Dr. Burr states in *Science* (Dec. 14).

Measurements of the potential of the tree have been made for more than a decade, but those of nearby moist earth were started only last summer. Dr. Burr hopes to install equipment for measuring atmospheric potential soon.

The potential difference is charted using two electrodes embedded in the cambium of the tree about three feet apart. There are daily, monthly and seasonal variations in the tree's electricity, and a suggestion of a correlation with sunspot activity, Dr. Burr reports. The potentials are measured in thousandths of a volt.

Science News Letter, December 29, 1956

BIOCHEMISTRY

Bee Sting Venom Causes Formation of Antibody

► **THE SEARCH** for immunity against bee stings is still far from over, but scientists at the University of Wurzburg, Germany, report finding that two components of bee venom cause antibody formation in rabbits.

Earlier studies have shown that bee venom is composed of two groups of ingredients, Ernst Habermann and Mahmoud M. A. El Karemi report in *Nature* (Dec. 15).

One group, the so-called "fraction I," contains the highly poisonous ingredients, they report. The other group, "fraction II," contains the enzymes phospholipase A and hyaluronidase.

Rabbits given repeated doses of the two enzymes built up immunity to them by forming antihyaluronidase and antiphospholipase in their body, the researchers found.

However, the highly poisonous "fraction I" caused no apparent production of antibodies, and the body fluid from immunized rabbits was helpless against the effects of the toxin in white mice or on human red blood cells, they reported.

Science News Letter, December 29, 1956

GEOPHYSICS

Launch Sub-Satellites

Aluminum-coated plastic objects that inflate automatically after ejection will be hurled from third rocket booster that takes satellites into earth-circling orbits.

► SOME of the earth satellites that will be fired hundreds of miles high as a part of the research programs of the International Geophysical Year will carry "sub-satellites."

The sub-satellite will be made from aluminum coated plastic, and will be automatically inflated after it has been ejected from the third rocket booster that sends the satellite itself to its maximum altitude.

William J. O'Sullivan, Jr., aeronautical research scientist at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics, is credited with having conceived the novel manner of construction.

The sub-satellite will be inflated to a diameter of 20 inches, the same as the satellite itself. Including the necessary inflation gear and container, the sub-satellite will weigh only 10-1/2 ounces. Larger sub-satellites that would be visible to the human eye may be built for later use.

A sub-satellite will be especially valuable in measurement of the density of air in the extreme outer limits of the earth's atmosphere and in determining the satellite's drag. The information which will be obtained by visual and radar observation from the ground, will be of great interest because of its bearing on the design of future satellite vehicles, long-range, rocket-boosted hypersonic gliders, and intercontinental ballistic missiles, Mr. O'Sullivan said.

The basic material of the sub-satellite is the plastic Mylar, with an extremely thin coating of metallic aluminum. Mr. O'Sullivan said that the thickness of the plastic material (25 ten-thousandths of an inch) even after the application of aluminum (6 ten-thousandths of an inch) is about the same as that of the foil used to wrap chocolate bars. By itself, the sub-satellite will weigh less than one-quarter of a pound.

The IGY satellites will be fired skyward by multi-stage rockets, then released to orbit around the earth. The sub-satellite will be ejected immediately after the satellite is released from the final rocket booster.

If it were possible for a man to be watching, it would look as if a wad of tinfoil had been tossed out. A very small pressure capsule, filled with hydrogen, will be triggered to inflate the sub-satellite to precisely the desired degree.

Mr. O'Sullivan said design and construction of the inflation device had to be carefully worked out because of the need to insure a high degree of accuracy of operation and very low weight.

The metallic covering of the sub-satellite is to give the plastic structure adequate rigidity after inflation so that it will keep

its shape even after the inflating gas has been released.

The aluminum covering serves other useful purposes; it protects the plastic from the action of ultraviolet and other radiation, and increases greatly the reflectivity of the sub-satellite for ground observation, both visual and radar.

Because of its extreme lightness, compared to its size, the sub-satellite will be affected to a correspondingly greater degree by the drag of the minute concentration of atmosphere. This fact will increase similarly the ability of the ground observation stations to obtain accurate drag measurements.

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BIOLOGY

Honey Bees Are Found To Eat and Smell Alike

► THE HONEY BEE'S HIVE is one big "welfare state," where everyone shares the same food and smells alike, Dr. Ronald Ribbands of Cambridge University, England, has found.

A single sample of sugar or nectar, brought home by a forager bee, Dr. Ribbands says, makes the rounds of the entire bee colony. It is passed on from honey bee

to honey bee irrespective of age or occupation until upward of 50,000 offspring from a single queen bee have shared a stomachful.

Sharing the same menu also results in sharing the same smell. This odor, Dr. Ribbands states in the annual report of the Smithsonian Institution, is a "scent language" that is a basis of the bee's extremely complex social life.

This building up of a distinctive colony odor, Dr. Ribbands explains, enables members of the colony to recognize each other. The honey bees use this odor differentiation as a burglar alarm and password, thereby protecting their hive and food against bees from another colony.

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Plane in Antarctic Lands At South Pole First Time

See Front Cover

► THE FIRST AIRPLANE LANDING to be made at the South Pole was achieved by seven men of Task Force 43, now in the Antarctic in support of Operation Deepfreeze II.

The aircraft is shown in the photograph on the cover of this week's SCIENCE NEWS LETTER. Rear Admiral George J. Dufek, U.S.N., was the expedition's leader.

Other members of the history-making crew included Capt. Douglas Cordiner, U.S.N., Capt. William Hawkes, U.S.N., Lt. Comdr. Conrad Shinn, U.S.N., Lt. John Swadener, U.S.N., and John Strider and William Gumbie Jr., Navy Specialists.

The airplane is based at Williams Air Operating Facility at McMurdo Sound.

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FLAG AT SOUTH POLE—Rear Admiral George Dufek stands beside the flag planted by his group at the South Pole after making the first airplane landing there. With him is Capt. W. M. Hawkes, also of the Navy.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

► **Education Scientific.**—Venezuela, exactemente como su gigante vicino septentrional, suffre de un serie disproportion inter le crescentia de su economia technologic e le capacitate de su systema scholar de educar juvenes scientistas e technicos. Tamen, le effortos venezuelan de corrigir iste situation non remane sin successo. In 1954 le Universitate Caracas habeva 888 studentes de ingenieria e 1.289 studentes medical. Hodie le mesme universitate ha 1.320 studentes de ingenieria e 1.260 studentes medical. Simile tendentias es a notar in le scholas primari e secundari.

► **Endocrinologia.**—Dysfunction del glandula thyroide es inter le factores responsabile pro carie dental. Recercas al Universitate Indiana ha demonstrate que rattos suffre un augmento de carie per 25% si lor glandula thyroide es inactivate per le administration de 500 microcuries de iodo radioactive. Duo intervallate doses de 250 microcuries reduceva sed non supprimeva le activitate thyroide e resultava in 7% de augmento de carie. Cinque intervallate doses de 100 microcuries non accelerava le formation de carie.

► **Anesthesiologia.**—Dr. L. Goldie del Hospital Maudsley a London reporta excellent successos in le uso de hypnose in loco de omne altere anesthetic in casos de minor operationes, reductiones de ossos frangite, suturas de vulneres, etc. Dr. Goldie signala que le methodo es de grande valor potential specialmente in le tractamento de casos de urgentia ubi le operation debe esser interpredite sin ulle retardo e in dispecto del facto que le patiente ha recentemente mangiate.

► **Entomologia.**—Blattas, probabilemente le plus detestade de omne insectos, fluoresce in belle e clarissime e semper cambiante colores, providite que on regarda los in un campo de lumine ultraviolette. Iste remarcabile facto esseva constatate in laboratorios del armae statounitese. On crede que le phenomeno reflecte variationes del activitate secretori de certe organos del blattas. Usque nunc le studio copri 19 species de blattas. Illo va continuar.

► **Recercas de Tuberculose.**—Duo centos porcos de India ha essite installate al Hospital del Administration de Veteranos a Baltimore in cavia in que le total provision de aere es adducite ab salas hospitalari habitate per patientes de tuberculose active. Le percentage de porcos de India que developpa tuberculose e le intervallo de tempore usque al declaration del morbo va servir a clarificar le question de si o non tuberculose es transmissible per via aere. Iste information es importante in le interesse del effice e economic protection del personal.

► **Aeronautica.**—Aviones con motores a reaction require longe cursos de atterrage, un facto que reduce lor empleabilitate militar in territorios sin aerodromos de dimension e qualitate superior. Le marina statounitese experimenta con un portabile installation de frenage que rendera parve aerodromos capace a recipier aviones a propulsion reactive. Il se tracta in principio simplemente de un piston in un tubo plenate de aqua. Le piston es attachate a un cabo. Iste cabo es deposite a transverso le curso del aeroplano. Quando le aeroplano crucia le cabo, illo trahle lo con se e expende su energia de propulsion in trainar le piston a transverso le aqua.

► **Rheumatologia.**—Un studio statistic re-

portate al Association Rheumatologic American corrobora le jam cognoscite facto que arthritis es plus frequente in feminas que in homines. In ultra le studio revela le nove information que feminas maritate es plus frequentemente arthritic que feminas non-maritate. Feminas divorciate non retorna al categoria del non-maritatas. Al contrario, illas es ancora plus arthritic que le maritatas. On debe supponer que iste facto resulta del effecto de factores emotional.

► **Hospitales.**—Le quietude de hospitales es proverbial sed apparentemente pauco real. Dr. D. Groom del Schola Medical Sud-Carolina se preoccupava del possibilitate que murmures cardiac escappa frequentemente al auscultation in consequentia del nivello de ruoto in le ambiente. Pro investigar iste question, Dr. Groom mesurava le nivello de ruoto in typic salas de consultation hospitalari e trovava que illo amonta a usque a 75 decibels. In comparison ille nota que le interior de un moderne avion, le DC-6, ha pauco plus que 100 decibels.

► **Cardiologia.**—Esseva reportate le prime operation del valvula mitral con le corde chirurgicamente aperte. In previe operationes del valvula mitral, le necessitate de mantener le activitate del corde resultava in le necessitate secundari de operar via aperturas natural, i.e. sin aperir le corde mesme e consequentemente sin le possibilitate de vider le progresso del intervention. Le operation a corde aperte, executate per Drs. A. K. Merendino e R. A. Bruce de Seattle, esseva possibile gratus al uso de un pompa oxygenatori que reimplacava temporariamente le functiones del corde e del pulmones.

► **Astronomia.**—Le notion que le planeta Venere possede un atmosfera de vapor de aqua es rejicite per Dr. E. J. Opik del Observatorio Armagh in Nord-Irlanda. Dr. Opik insiste que le nubes que investi Venere es composita de pulvere roccose. Isto es plus compatible con le coloration jalne que illos exhibi. Le nubes deberea esser blanc si illos esseva aqueose. Dr. Opik etiam opina que la supposition de un temperatura medie de minus 40 C pro Venere es intenable. Ille crede que plus 45 C es plus probable. Le opinion de Dr. Opik se basa super certe premissas que es non ancora definitivemente demonstrate.

► **Psychiatria.**—Le institutiones statounitese pro alienatos ha un population de circa 750,000. Durante le passate 10 annos, le excesso de nove admissiones super le dimissiones amontava a circa 12,000 per anno. In 1955 iste excesso descendeva a 6,000, signalante un significative melioration del situation del morbos mental que deposit 25 annos habeva monstrate un alarmante tendentia augmentatori. Infelicemente un portion considerabile del melioration es simplemente le expression statistic del facto que nove methodos de tractamento es plus compatible con permitir al patientes que illes reside a lor domicilios private.

► **Hematologia.**—Le normas pro rubie corpusculos e hemoglobina in le sanguine de feminas es considerabilemente plus basse que le standards stipulate in le literatura e generalmente acceptate in le practica medical. Dr. Harriet E. Judy de Spokane in Washington basa iste conclusion super un studio de 7,000 casos. Ex iste total illa seligeva 663 individuos "patentemente normal" e derivava ab mesurationes in illas un standard feminin de 4,370,000 in loco de 4,850,000 erythrocytes e de 12.5 in loco de 13.8 g hemoglobina.

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GENERAL SCIENCE

Reading Interlingua

► **YOU CAN READ Interlingua** if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

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OCEANOGRAPHY

Seasonal Ocean Level Rise

➤ OVER ALL, of the northern oceans there is a "gentle rise" in sea level starting in spring or summer and reaching a high point in fall or winter.

The amount of rise from lowest to highest averages about eight inches, although it varies greatly from place to place. Dr. June G. Patullo of Scripps Institution of Oceanography, La Jolla, Calif., reports in *Research Reviews* (Nov.).

The seasonal variations in sea level are about the same over very long distances, even across oceans.

To find out how the ocean looks on a global scale, Scripps scientists reduced 100,000 values of the mean monthly height of sea level at various places to 5,000. Then they plotted and combined these to get the over-all picture.

The sea surface undergoes changes in shape on many different time scales. The yachtsman recognizes a quick gust of wind by the dark patch of tiny ripples it makes as soon as it touches the sea surface.

On the other hand, the slow loss of water from oceans to icecaps over thousands of years is revealed by benches the water has cut into the edges of the continents.

Until recently, scientists recognized only a few of the variations between these two time scales. They knew of ripples, with fractions of a second between crests; chop, which is several seconds long, and swell, about 20 seconds long.

Then there was a gap up to periods of around 12 to 24 hours, which are the tides. Until the Scripps oceanographers made their study, practically nothing was known about

changes with periods longer than the tides but shorter than the slow changes in sea level that take many years.

The cycle of sea level changes in the Southern Hemisphere is more or less a mirror image of what is observed in the north, Dr. Patullo reports. When sea level is high north of the equator, it is low in the south.

She suggests visualizing the sea surface tilting back and forth throughout the year, with the equator as a sort of fulcrum.

Close inspection of the Northern Hemisphere tide gauge data showed that the oceans are not behaving quite as units. Tide gauges between the equator and a latitude of about 45 degrees north show a maximum height in September, while gauges north of 45 degrees have a maximum in December.

Drs. Walter Munk, Elizabeth Strong and Roger Revelle, director of Scripps Institution of Oceanography, worked with Dr. Patullo.

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● RADIO

Saturday, January 5, 1957, 1:45-2:00 p.m., EST.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Yigael Yadin, professor of archaeology, Hebrew University, Jerusalem, Israel, will discuss "The Seventh Dead Sea Scroll."

BIOCHEMISTRY

Body Chemical That Strengthens Heart Action

➤ ISOLATION of a chemical found in mammalian tissue that strengthens heart action in frogs is reported in *Science* (Dec. 14) by researchers at the National Heart Institute, Bethesda, Md.

Named palmitoyl lysolecithin, the chemical's action resembles that of digitalis, a drug widely used as a heart tonic.

Earlier studies with frog hearts have shown that the heart, when isolated from the body, gradually loses force in its contractions.

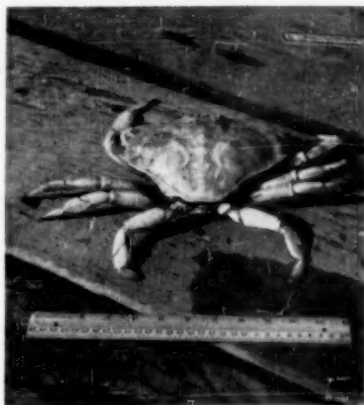
This type of failure is known to be reversed by either adding digitalis or including the liver in the circulation path of the heart. Mammalian serum was also found to reverse this failure in a frog's heart, the researchers report.

By chemical analysis of mammalian tissue they were able to isolate one of the active ingredients responsible for the digitalis-like effect.

The most abundant source examined was found to be the center portion of beef adrenal glands.

Drs. Elwood Titus, Herbert Weiss and Stephen Hajdu of the National Heart Institute report the work.

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WHITE CRAB—This unusual white specimen is being kept alive by the Oregon Fish Commission because scientists are anxious to see if the abnormality persists when the crab molts.

BIOLOGY

White Crab in Oregon Is Second in Eight Years

➤ A WHITE DUNGENESS CRAB, only the second one seen in some eight years, has been brought into the Shellfish Laboratory of the Oregon Fish Commission, Newport, Ore.

The crab appears normal in every respect except its lack of coloration. It is alive and being kept in the aquarium at the laboratory.

Biologists hope to find out if the abnormality carries over in the new shell after the crab molts. Crabs must shed their shell periodically in order to grow. Molting usually occurs annually in larger crabs during fall months in Oregon waters.

This entirely white, male crab was brought to biologist Lowell D. Marriage at the Shellfish Laboratory by commercial fisherman George Zinserling from Nehalem Bay.

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GENETICS

Breeding Tenderness Possibility Tested

➤ THE POSSIBILITY of breeding tenderness on the hoof has been suggested by the U. S. Department of Agriculture.

Research by Government scientists shows that meat tenderness is inherited in animals and can be passed to succeeding generations through selective breeding.

Scientists at the USDA Agricultural Research Center, Beltsville, Md., are currently testing both rabbits and beef cattle for their heritability of tenderness.

They are also trying to develop a quick, reliable test for tenderness that can be used on live animals.

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MEDICINE

Sex Hormones Relieve Pain of Advanced Cancer

➤ SEX HORMONES offer "profound and gratifying benefits" for breast cancer patients that are beyond the hope of surgery and radiological treatments, Drs. Edward F. Lewison, Frances H. Trimble and Robert S. Ganelin, Johns Hopkins University, report in the *Journal of the American Medical Association* (Dec. 15).

Both androgens and estrogens, male and female sex hormones, relieved pain either partially or completely, and created a sense of well-being in about half of the 133 patients studied. All had advanced breast cancer.

Some of the patients received male hormones only, others female hormones only, and a third group received a combination of the two. All three groups experienced approximately the same amount of pain relief.

The scientists stress the fact that the hormones are certainly not a "cure" for advanced mammary cancer. They only offer relief from pain.

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GEOLOGY

Argon Helps Date Rocks

►THE AGE of "young" rocks, that is rocks that are only a million or so years old can now be told accurately.

Previously geologists could not be sure of the age of rocks less than a hundred million years old.

In the past geologists have used chiefly the radioactive decay of uranium into lead for dating.

This involves much work, is not as accurate as scientists desire and does not work well on younger rock.

So scientists have developed potassium-argon dating. Potassium 40 decays through radioactivity into argon, and the rate at which argon accumulates in rocks from this decay is known.

In one test, a rock sample is dissolved in molten sodium hydroxide. This releases argon, which is collected and measured. By determining how much argon is released, the scientists can then determine how old the rock is.

In addition to providing a measure of age for younger rocks, the technique has other advantages over uranium-lead dating. It is simple, rapid and accurate. Small samples can be used.

One disadvantage is that the argon leaks out of some minerals, such as feldspar, making their dating difficult.

The method has been used to test several sites in California by University of California scientists John H. Reynolds, Carniss H. Curtis, Jack F. Evernden and Joseph I. Lipson. Two sites, a million and a half years old, whose ages were fairly well established by other evidence, were accurately measured.

The scientists have also dated formations of granodiorite on the Farallon Islands, off the Golden Gate, at about 90,000,000 years and granitic samples from Yosemite Valley at 80,000,000 to 95,000,000 years.

Glaucinite samples from oil well cores are now being tested with the hope that accurate measures of the sequence of the strata can be made. These are formations believed to be in the 10,000,000 to 90,000,000 year range.

Four graduate students, William Eisenhardt, Peter Wygle, Stanley E. Cebull and Allen Ryall, assisted in the investigation.

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BIOCHEMISTRY

Gray Hair Caused by Too Little Lysine

►A CLUE to what makes hair turn gray may have been found in experiments with lysine, one of the amino acids produced by the digestion of protein.

Lysine, long known to be necessary for proper growth in experimental rats, is also necessary to keep black rats from turning gray, Dr. F. H. Kratzer and Pran Vohra of the University of California at Davis report in *Science* (Dec. 7).

They found that when black male rats were fed a diet deficient in lysine, the animals grew a coat of hair that was much finer in texture and lighter in color than the hair of a group of rats receiving supplemental lysine.

This effect would have been difficult to notice in earlier studies, they report, because only albino or white rats had been used before to determine the effects of lysine.

Too little lysine also causes a loss of pigment in turkey feathers, they found. The scientists believe the lysine plays some part in the animal's production of melanin, the dark pigment found in the skin and hair.

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BIOCHEMISTRY

Clue to Mystery Bacilli That Resemble TB Germs

►MYSTERY BACILLI that resemble tuberculosis germs but do not produce the disease have been found to contain a chemical component not found in the tubercle bacillus, Dr. Floyd M. Feldmann, medical director of the National Tuberculosis Association, has reported.

These mystery bacilli are coughed up by patients suspected of having tuberculosis and they resemble tuberculosis bacilli in many ways, including having the same staining characteristics.

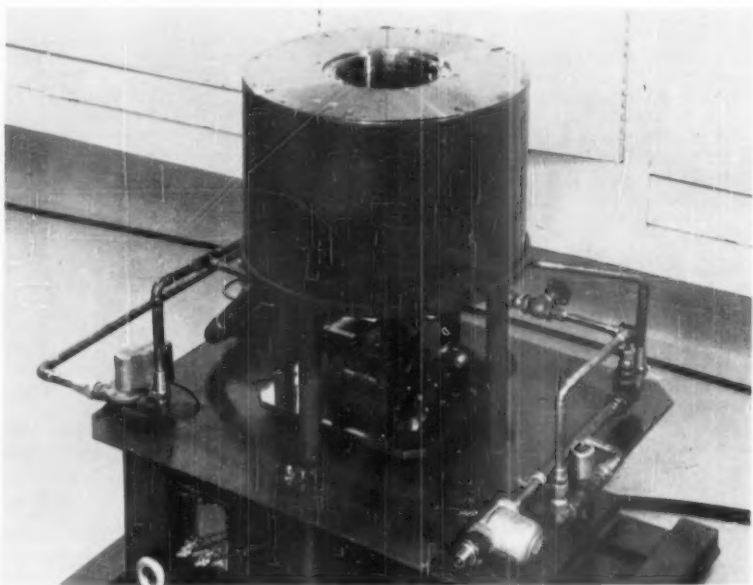
When grown in the laboratory, however, they produce colonies that are much more colorful than the faint-cream tubercle bacillus, ranging from yellow to deep orange. They do not produce progressive disease in guinea pigs.

Using new chemical and physical techniques, Drs. Donald W. Smith, University of Wisconsin, and H. M. Randall, University of Michigan, analyzed several strains of the mystery bacilli to find out how they differed from disease-producing ones. They found that all strains analyzed thus far have contained a chemical component not found in the tubercle bacilli, and have named it "compound G."

They are attempting to devise a simple test for detecting it in the microorganisms coughed up by patients.

"Such a test would obviously be a great help to the doctor treating the patient," said Dr. Feldmann.

Science News Letter, December 29, 1956



"HYDRO" REACTOR—The Los Alamos Scientific Laboratory's latest critical assembly machine, "Hydro," is shown in this photograph. The central cavity, a stainless steel can extending part way down into the larger tank, contains the fissionable material. A similar cavity on the under side permits insertion of a polyethylene cylinder that acts as a control rod. Ordinary water is circulated between the two inner ends and in the space around them. The intense source of fission neutrons is designed to operate at three kilowatts, compared to the few watts of previous air-cooled machines. It was designed with a flat top to permit easy installation of experimental equipment.

ASTRONOMY

See Winter Constellations

Orion, generally considered to be the finest constellation in the sky, has two bright stars with a row of three of medium brightness between them, making it easy to identify.

By JAMES STOKLEY

► TO ORION and all the other brilliant winter constellations that decorate the January evening sky there is now added the planet Mars.

Although dimmed to about one-sixteenth of its brilliance in September, when it made a close approach to earth, it is still as bright as a typical star of the first magnitude, very similar to Betelgeuse, the uppermost bright star in Orion.

Mars is now in the constellation of Pisces, the fishes, visible in the southwest at the times for which the accompanying maps are drawn, i.e., about 10:00 p.m., your own kind of standard time at the first of January, an hour earlier at the middle of the month and two hours earlier as it comes to an end.

Many times more brilliant than Mars, however, is one of the stars now visible. Different from the planets, which shine by the sunlight they reflect, Sirius and the other stars are actually far distant suns, shining themselves.

Sirius, often called the dog-star, is in the southeast, in Canis Major, the great dog. The lesser dog, Canis Minor, is above and to the left. In it we find Procyon, another first-magnitude star.

To the right of Procyon, high in the south, is Orion, the warrior, generally considered the finest constellation in the sky.

Its characteristic form—two bright stars with a row of three of medium brightness between them—makes it easy to identify.

Shown on Old Star Maps

As pictured on the old star maps, which drew around the stars the figures the constellations were supposed to represent, the three stars were Orion's belt. Betelgeuse and Bellatrix, a fainter star just to the right, were his shoulders; while Rigel, the bright star below, was in one of his legs.

Above Procyon is the figure of Gemini, the twins, and the brightest stars in this group are Castor and Pollux. The latter is the brighter, for in this case the twins are not identical. Pollux is a star of the first magnitude, while Castor is of the second.

Almost overhead, in Auriga, the charioteer, Capella can be seen.

As we pass from this group toward the south, going to the right of Orion, we come to Taurus the bull, which was shown on the old maps charging upon Orion. In Taurus is a first-magnitude star distinctly red in color. This is Aldebaran, which marks the bull's eye.

Although most of the bright stars of the

January evening are in and around the form of Orion, two others are shown on the maps, both somewhat dimmed by reason of their low altitude and the increased absorption of their light by the earth's atmosphere which that causes.

Low in the east is Leo, with the bright star Regulus. In the northwest, still just visible above the horizon, is the upper part of the figure of Cygnus, the swan, with the star called Deneb. A few months ago this was shining brilliantly in the south and southwest.

In fact even now, if you look early in the evening, just after dark, you will see it in a similar position.

Three other planets come up later at night. Jupiter, even brighter than Sirius, is in Virgo, the virgin, and rises just before midnight. Saturn, in Scorpius, the scorpion, comes up about two hours before sunrise, while Venus appears above the southeastern horizon just before dawn.

1957 Astronomical Program

Looking ahead to the astronomical program for 1957 we find that it offers four eclipses—two of the sun and two of the moon—although none of these are visible generally in the United States.

However, another event, much rarer than an eclipse, occurs in May and will be visible generally in North America, all except the extreme eastern part.

This is a transit of Mercury across the face of the sun.

Since that planet and Venus both move in orbits that are smaller than the earth's orbit, both may come between the earth and the sun.

Every 116 days, in the case of Mercury,

and every 584 days for Venus, they are in the same general direction from the sun as we are, but normally they are either north or south of the line from the sun to the earth.

Hence there is no transit, and the planet does not pass across the disc of the sun.

It is very rarely that conditions are right to produce a transit of Venus. The last occurred in 1882, while the next will not happen until 2004.

Mercury Transits in May

Transits of Mercury are more common. There was one on Nov. 13, 1953, there is one in 1957 on May 5, and there will be another on Nov. 6, 1960. Mercury is so small that a telescope is needed to see a transit.

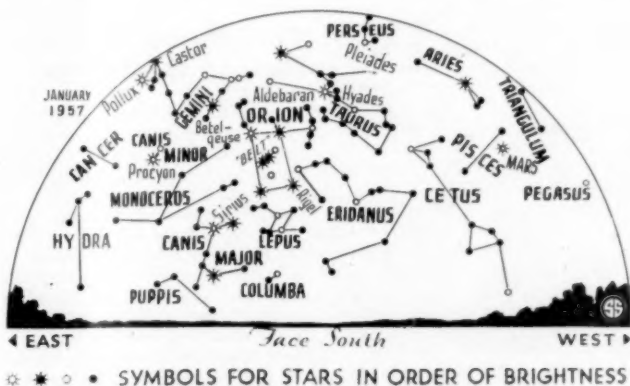
Venus is larger, and when it is in transit only some protection for the eye, to enable the observer to look at the sun, is needed to show it as a tiny spot on the sun's face.

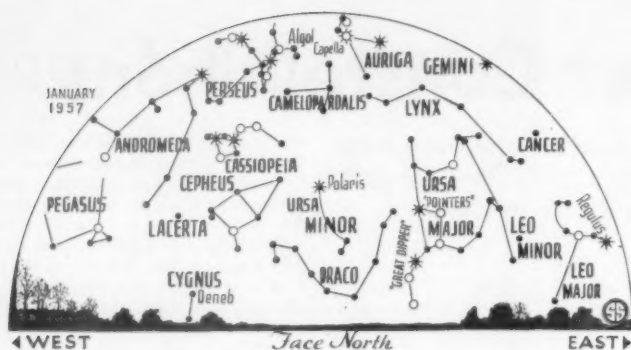
The year's first eclipse will come on April 29. Along a curved path in the Arctic regions north of Europe, the moon will be seen to come in front of the sun. It will not hide it completely, however, as this is what is called an annular eclipse, which happens when the moon is far enough away that it appears a little smaller than the sun.

Hence, even though it comes in front of that orb, a ring of the solar surface will remain visible around the lunar disc. Almost all of Asia, as well as Alaska, western Canada and the northwestern United States, will see a partial eclipse of the sun.

Two weeks later, on May 13, the moon will enter the shadow of the earth, producing a total lunar eclipse, visible generally over Europe, Asia, Africa, Australia and Antarctica. Before it is over the moon will rise along the eastern coast of North America, so this region will see the concluding phases.

Then, on Oct. 23, comes another eclipse of the sun, total this time, although few will see it. For only in a small region off the





coast of Antarctica, south of the Atlantic Ocean, will the total eclipse be visible.

The southern tip of Africa, Madagascar, most of Antarctica, and a large area of the Indian Ocean will have a partial eclipse.

Nov. 7 brings another total eclipse of the moon. This time the beginning is visible generally over North America, except for the eastern part, the region that saw the end of its predecessor. Asia, Australia, Alaska and the Pacific Ocean with its adjacent areas will be the part of the world where this eclipse will be visible.

Celestial Time Table for January

JAN. EST

- 3 1:00 a.m. Earth nearest to sun, distance 91,347,000 miles.
- 4 3:00 a.m. Moon farthest from earth, distance 252,400 miles.

- 5 3:36 a.m. Algor (variable star in Perseus) at minimum brightness.
- 8 12:26 a.m. Algor at minimum.
- 9 2:06 a.m. Moon in first quarter.
- 3 14:5 a.m. Moon passes Mars.
- 10 9:15 p.m. Algor at minimum.
- 13 6:04 p.m. Algor at minimum.
- 16 1:21 a.m. Full moon.
- 5:00 p.m. Moon nearest, distance 222,000 miles.
- 20 2:51 p.m. Moon passes Jupiter.
- 22 4:48 p.m. Moon in last quarter.
- 25 6:38 p.m. Moon passes Saturn.
- 28 2:10 a.m. Algor at minimum.
- 29 12:53 a.m. Moon passes Venus.
- 30 4:24 p.m. New moon.
- 11:00 p.m. Algor at minimum.
- 31 9:00 a.m. Moon farthest, distance 252,700 miles.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 29, 1956

PSYCHOLOGY

Score Absentee Workers

► **WORKERS** with "child minds in adult bodies" who cannot face up to adult responsibilities account for a great part of the country's time lost from work, Dr. N. Gillmor Long, Lumbermens Mutual Casualty Company, reports in *Industrial Medicine and Surgery* (Dec.).

These "drone bees of society" cost industry and the public an estimated \$180,000,000 per year, Dr. Long reports.

His list of "drone" type workers, those that came under the title of "goldbricks" in the army, includes those who hate society in general, those who are occupationally square pegs in round holes, and those who are emotionally inadequate through frustration either at home or with fellow workers. They get relief by taking a day off now and then, reports Dr. Long.

One large group is made up of workers who feel they are not paid enough or are "too good for the job," Dr. Long reports. Another type of absentee is one whose wife and unmarried family members bring in a substantial income. This type will "knock off" a day occasionally to go fishing, says Dr. Long.

By careful charting he has also found a

group of Monday or Friday offenders, who think the company owes them an extra day or so.

One absentee worker can ruin a whole department, Dr. Long believes. Fellow workers quickly get dissatisfied when they see their co-worker "flitting about town on his self-selected extra days off."

Science News Letter, December 29, 1956

PHYSICS

Zero Power Reactor Now in Operation

► **A NUCLEAR REACTOR** with practically no power output has gone into operation at the Argonne National Laboratory, Lemont, Ill., in order to make possible studies on fundamental principles of future reactors for power purposes.

ZPR-V, meaning No. 5 in a series of zero power reactors, contains two zones, one that produces "slow" or thermal neutrons, which then pass into the fast section to cause fission in enriched uranium. The entire unit, containing uranium fuel and control rods, is in a five-foot diameter tank.

Science News Letter, December 29, 1956

PSYCHOLOGY

Mentally Ill Cannot See Proverbs' Meaning

► **AN UNDERSTANDING** of the meaning of proverbs differentiates mentally sound persons from those with the common mental illness, schizophrenia.

This handy method for picking the mentally ill from the normal, found in research at the Veterans Administration Center, Baylor University, is reported in the *Journal of Consulting Psychology* (Dec.) by Dr. Donald R. Gorham.

Here is a sample proverb with four possible meanings to select from:

The sun shines upon all alike.

- a. It's the same sun everywhere.
- b. All are created equal.
- c. The sun shines on everybody.
- d. People that do the same things are alike.

The normal person, Dr. Gorham points out, is able to handle abstractions. The schizophrenic is limited to thinking concretely. Normal subjects, even as young as fifth graders, are able to score well on proverb tests.

Dr. Gorham tried the test on 332 Air Force basic airmen and 232 hospitalized schizophrenic veterans. From these groups he selected 100 Air Force men and picked 100 chronic schizophrenics to match them in sex, education and intelligence.

The proverbs test was found to separate correctly 80% of the normal subjects and 75% of the schizophrenic patients.

The test was not so effective, however, when used on paranoid patients.

If the test were used to sort out a group, only one percent of whom were schizophrenic, the test would not be so satisfactory, Dr. Gorham warns. However, if it is used on a clinic group of persons seeking assistance for mental and emotional problems, its value would be much greater.

Science News Letter, December 29, 1956

PUBLIC HEALTH

Rodents, Lizards May Carry Valley Fever Germ

► **RODENTS**, lizards and fish could be reservoirs for the organism that causes coccidioidomycosis (valley fever) in humans.

Twelve species of mammals, including rodents, skunks and rabbits, and such cold-bloods as crayfish, goldfish and lizards, were inoculated with *Coccidioides immitis*, the valley fever organism.

All the mammals died from the disease and the crayfish, goldfish and lizards developed lesions in which living organisms were present.

This is one of the few instances known in which organisms that attack humans also act similarly on cold-blooded animals such as fish and lizards. It was found in research by Drs. Frank E. Swatek and Orda A. Plunkett of the botany department at the University of California at Los Angeles.

Science News Letter, December 29, 1956

PUBLIC HEALTH

Colored Dyes Cathartic

► FEAR that a coal tar dye used to color food, drugs and cosmetics might cause cancer is unfounded, Drs. Jack L. Radomski and Wm. B. Deichmann, University of Miami School of Medicine, Coral Gables, Fla., report in the *Journal of Pharmacology and Experimental Therapeutics*.

Earlier studies with Food, Drug, and Cosmetic (FD&C) dyes Yellow No. 3 and No. 4 had shown that, when these dyes are decomposed by acid, one of the products is beta-naphthylamine, a coal tar compound known to produce cancer.

Experiments showed this did not happen in the stomach of rabbits, the scientists report. A small amount of the Yellow No. 4 dye was decomposed by the stomach's acid, they state, but the result was an unknown substance. It was not the dangerous beta-naphthylamine.

They also found that several of the dyes caused cathartic action in animals and man. These were the FD&C Orange Nos. 1 and 2, Yellow Nos. 3 and 4, and Red No. 32. Only the Orange No. 1 was cathartic in man, however.

The two orange colors and the red one have recently been taken off the list of dye colors certified safe for use in food by the U. S. Food and Drug Administration. They are still permitted in drugs and cosmetics for external applications, however, and the Red No. 32 is allowable on oranges only for a three-year period, or until a satisfactory substitute can be found.

The other two, Yellow Nos. 3 and 4,

are still on the certified list. Manufacturers and users of the colors were called recently to meet with the Food and Drug Administration. They were told of the Government's intention to hold a hearing on the dye colors, concerning their de-listing. This was a result of other studies showing the two colors are not literally "harmless" as the law requires, but actually cause blood system changes.

Science News Letter, December 29, 1956

GENERAL SCIENCE

Vos Pote Apprender Un Nove Lingua

► VOS POTE apprender un nove lingua, the magazine, *Pageant* (Jan., 1957), assures its readers. Then, by presenting an explanation and examples, the article written in Interlingua proves to its readers that they can understand the simple, natural, international language without study.

Interlingua formulated and introduced recently is now used for abstracts in more than a score of medical and other journals and congresses.

The article says, in part: Le majoritate del linguas europeas, le angese incluse, ha multe factores in commun. In consequentia logic del difficultates e del similitudines del linguas, un medio vermente international de communication ha essite disveloppate sub le direction de Dr. Alexander Gode del institution pro le popularisation del scientias que es cognoscite como SCIENCE SERVICE.

Science News Letter, December 29, 1956

PUBLIC HEALTH

Get Polio Shots Now, Warns Surgeon General

► "PROCRASTINATION" is one of the main reasons why too many Americans still have not received polio shots to protect themselves from the disease, Dr. Leroy E. Burney, Surgeon General of the Public Health Service, told SCIENCE SERVICE.

Since no one hears much about polio during the winter months, many people just forget about it now, he said. But when the polio season starts up again next spring, it will be too late to get all three of the necessary shots, the Surgeon General warned.

"I do not believe that the cost of the shots is the problem," Dr. Burney said, "since only six states have used up all the money appropriated by the Congress."

This money is being used to supply free shots to pregnant women and to persons 19 and younger who cannot afford them.

"An excellent job" has been done by the press in alerting the general public to the situation, Dr. Burney said. However, it is now time for the press to be backed up by community efforts, he said.

The job of encouraging people to get shots should be put on a "township to township basis," so that every single American would be urged to take advantage of the poliomyelitis vaccine, the Surgeon General stated.

Dr. Burney suggested that federated clubs throughout the country could do a valuable job in this community approach. The PTA, American Legion, Junior Chambers of Commerce, 4-H clubs and the like, he said, would make excellent groups for this kind of activity.

Science News Letter, December 29, 1956

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

CALCULUS REFRESHER FOR TECHNICAL MEN—A. Albert Klaf—Dover, 431 p., paper, \$1.95. Covering the most important aspects of integral and differential calculus in terms of the 756 questions most likely to occur to the technical reader. For a quick review of the subject. First published in 1944.

EXPANDING RESOURCES FOR COLLEGE TEACHING: A Report of the Conference on College Teaching Sponsored by the American Council on Education in Washington, D. C., January 19-20, 1956—Charles G. Dobbins, Ed.—American Council on Education, 137 p., paper, \$1.50. Containing suggestions of educators for solving the critical shortage of college teachers.

HANDBOOK ON BROAD-LEAVED EVERGREENS—E. Lowell Kammerer and others—Brooklyn Botanic Garden, 93 p., illus., paper, \$1.00. Beautifully illustrated booklet showing gardeners how to make the winter landscape more beautiful.

JOHN AND MARY R. MARKLE FOUNDATION 1955-56 ANNUAL REPORT—John M. Russell, executive director—Markle Foundation, 80 p., paper, free upon request direct to publisher, 511 Fifth Ave., New York 17, N. Y. Reporting on a program of five-year grants for young medical school faculty members.

THE LOST PYRAMID—M. Zakaria Ganeim—Rinehart, 175 p., illus., \$3.50. Telling the exciting story of the finding by the author of a pyramid hidden under the desert sand. Author is Egyptian chief inspector of antiquities.

LOW-FAT COOKERY—Evelyn S. Stead and Gloria K. Warren with an introduction by Eugene A. Stead, Jr., and James V. Warren—Blakiston, 184 p., illus., \$3.95. If you are overweight or have hypertension and your doctor has put you on a low-fat diet, this book will help you get enough to eat and enjoy it.

MATHEMATICS, MAGIC AND MYSTERY—Martin Gardner—Dover, 176 p., illus., paper, \$1.00. Tricks, puzzles and mathematical games will provide hours of entertainment for you and your guests.

NATURAL HISTORY OF BIRDS: A Guide to

MATH IS FUN

By Joseph Degrazia, Ph.D.

Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!

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Ornithology—Leonard W. Wing—Ronald, 539 p., illus., \$6.75. Intended for the general reader as well as the student, this work serves as an introduction to the subject and also a reference work.

PSYCHOLOGY: General, Industrial, Social—John Munro Fraser—Philosophical Library, 310 p., illus., \$7.50. Surveying the field from the manager's point of view.

REBEL WITHOUT A CAUSE: The Hypoanalysis of a Criminal Psychopath—Robert M. Lindner, introduction by Sheldon Glueck and Eleanor T. Glueck—Gröbe Press, 296 p., paper, \$1.45. Psychopaths make up the small proportion of the prison population that gives the most trouble. The technique of hypoanalysis seems to give insight into this problem. This book is a verbatim report of such an analysis.

REYNOLDS ALUMINUM AIR DUCT GUIDE—Reynolds Metals Co., 129 p., illus., paper, free upon request direct to publisher, 2500 So. Third Street, Louisville, Ky. An engineering treatise including guides for design and estimating.

SYMPOSIUM ON VITAMIN METABOLISM: Proceedings of a Symposium Held Under the Auspices of the University of Texas and the National Vitamin Foundation, Incorporated, New York City, March 6, 1956—G. M. Brown and others—National Vitamin Foundation, Nutrition Symposium Series Number 13, 118 p., paper, \$2.50. Summarizing, in part, present knowledge in this field and pointing to areas in which additional investigation is required.

TECHNICAL METHODS AND PROCEDURES OF THE AMERICAN ASSOCIATION OF BLOOD BANKS—John B. Ross and others—Burgess Publishing Co., rev. ed., 111 p., paper, \$3.00. A manual for laboratory technicians.

TRIGONOMETRY REFRESHER FOR TECHNICAL MEN—A. Albert Klaf—Dover, 629 p., illus., paper, \$1.95. For those who want to master the subject rapidly and for those who want a quick review. First published in 1946.

UNIT OPERATIONS OF CHEMICAL ENGINEERING—Warren L. McCabe and Julian C. Smith—McGraw-Hill, 945 p., illus., \$10.50. Text for junior or senior undergraduates.

UNIVERSITAS: A German Review of the Arts and Sciences, A Survey of Current Research, English edition, Vol. 1, No. 1—H. Walter Bahr, Ed.—Wissenschaftliche Verlagsgesellschaft (Rayelle), 111 p., illus., paper, quarterly, \$4.30 per year, single copies \$1.25. The first issue contains articles by the Nobelists Otto Aahn and Adolf Butenandt and other eminent scientists and men of letters.

A WORLD GEOGRAPHY OF FOREST RESOURCES—Stephen Haden-Guest, John K. Wright and Eileen M. Teclaff, Eds.—Ronald, American Geographic Society, 736 p., illus., \$12.50. Telling of the wealth provided by forests and their relation to rainfall, temperature and soil.

Science News Letter, December 29, 1956

Reported in the U. S. only since 1944, atrophic rhinitis is now considered a major disease of swine.

In 1956, aircraft sprayed and dusted insecticides on areas throughout the United States totaling more than 5,000,000 acres.

Do You Know?

Sound waves in a liquid clean by "cold boiling" with the repeated formation and collapse of millions of tiny entrapped vapor bubbles many thousand times per second.

Examination of thin sections of rocks on microscope slides enables the geologists to detect the presence of fossils—a valuable clue to oil.

Without tire chains it takes three to 12 times as far to stop an automobile on snow and ice as it does on dry pavement.

One of the newer chemical weed killers, dalapon, has proved effective for controlling quackgrass in potato fields, producing better yields.

SURGERY

Russian Describes Stapler For Severed Blood Vessels

➤ A RUSSIAN SURGICAL DEVICE that staples together the doubled-over ends of broken blood vessels with tantalum clips is described by Dr. P. I. Androsow of Moscow's Slivovskiy Institute in *Archives of Surgery* (Dec.) published by the American Medical Association.

This is the first Russian-authored medical article submitted for American publication in many years, and includes three papers on various uses of the surgical stapler.

The instrument has many parts but can be disassembled easily in a short time, Dr. Androsow reports. It solves the problem of restoring blood supply stopped by injury or disease, and opens the way for "unlimited grafting" of various organ parts throughout the body.

Because only four parts of it have to be operated, it is "within the reach of rank-and-file surgeons," Dr. Androsow believes.

Previous methods of sewing severed vessels back together were time consuming and subject to repeat bleeding, the Russian surgeon says, but the new mechanical method makes possible "automatically faultless" connections.

Two other uses of the device reported are for the creation of an artificial esophagus and the by-passing of blood vessel aneurysms.

The artificial esophagus, the channel connecting the throat and stomach, is made from a section of small intestine. The surgical stapler makes it possible to preserve the transplanted intestine's blood supply by connecting the graft to other blood vessels.

For aneurysms, the balloon-like swellings in weakened sections of a blood vessel, the stapling device is used for connecting a graft to by-pass the affected spot.

The instrument was designed by a team of Russian engineers and physicians including Dr. Androsow.

Science News Letter, December 29, 1956

GENERAL SCIENCE

Science Summer Schools

► APPROXIMATELY 4,500 high-school and 250 college teachers of science and mathematics will benefit during next summer from teacher-training programs sponsored by the National Science Foundation at summer institutes in 95 colleges and universities throughout the United States and its Territories.

Grants totaling \$4,800,000 support these summer institutes. Eighty-six of the institutes will be open only to high-school teachers of science or mathematics. Four will be open to both high-school and college teachers and five to college teachers only. Six institutes offering a course in radiation biology only for high-school teachers are being jointly sponsored by the Foundation and the Atomic Energy Commission.

"Often the critical motivating influence on the youngster groping his way toward a career is the high-school teacher," Dr. Alan T. Waterman, NSF director, said. "Teachers, after all, determine the quality of instruction. Able and dedicated teachers not only impart knowledge; they create a desire for it."

"Through its widely expanded summer-institute program, the Foundation hopes to provide opportunities for teachers of science to cooperate in improving the quality of their teaching and to learn at first hand of recent research progress in their respective fields. By this means more youngsters with aptitude for science may be motivated toward careers in science, mathematics, and engineering through improvement of the quality of instruction they receive in high school."

Congress at its last session earmarked \$9,500,000 of its appropriation to the Foundation for the supplementary training of high-school teachers of science and mathematics.

The summer institutes are in addition to

16 academic-year institutes for which the Foundation recently announced support in an amount of \$4,065,000 and an expected enrollment of 750 high-school science and mathematics teachers. In both programs, teachers will pursue a course of study in science and mathematics planned especially for them and conducted by leaders noted not only for competence in their fields but for skill in presentation.

The Foundation grants to each summer institute will cover costs of tuition and other fees for a specified number of teachers—from 10 to 20, the average size to be approximately 50. Most institutes will pay stipends directly to participating teachers at the rate of \$75 per week. Additional allowances for dependents to a maximum of four and for travel are provided.

Applications for the institutes are being received by the institutions at which they are to be located.

In addition there will be a number of summer institutes supported by industry and private foundations, as there have been in past summers.

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Questions

ASTRONOMY—What is a transit? p. 407.

☐ ☐ ☐

BIOPHYSICS—What is the effect of repeated X-ray doses compared to a large single dose? p. 402.

☐ ☐ ☐

GEOLOGY—How can argon be used to date rocks? p. 406.

☐ ☐ ☐

GEOPHYSICS—What are sub-satellites? p. 403.

☐ ☐ ☐

OCEANOGRAPHY—How much does the northern ocean level rise average per year? p. 405.

☐ ☐ ☐

PSYCHOLOGY—What use has been found for testing a person's understanding of the meaning of proverbs? p. 408.

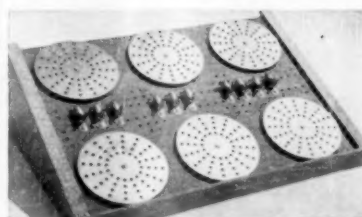
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PUBLIC HEALTH—Why should people get their polio shots now? p. 409.

☐ ☐ ☐

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BAGGING MACHINE loads almost any size or shape of package at speeds far in excess of hand-loading. It can open and load all types of bags including lip, gusseted, paper and plastic. The machine, available in several models, has special use for bags affected by static electricity or tackiness.

Science News Letter, December 29, 1956

WASHABLE PAINT covers an unpainted area with one coat. Based on a plastic vinyl acetate resin latex, the interior paints may be compounded at a pigment volume greater than that for latex paints. The paint provides one-coat hiding with no sacrifice in washability and freeze-thaw stability.

Science News Letter, December 29, 1956

HELMET HATS for young sports enthusiasts of the grade school set are formed from light, tough sheeting of a butyrate plastic. Protectors for skating, scootering and bicycling, one helmet has a foam headband and cushion and adjustable chin strap. Others have an elastic headband.

Science News Letter, December 29, 1956

VACUUM BOTTLE with an unbreakable liner, shown in the photograph, keeps liquids or solid foods hot for five hours or cold for six hours. The plastic liner is sealed inside an unbreakable polyethylene plastic case and cushioned by millions of



tiny insulating cells made of urethane foam. A small hole does not destroy the insulation's effectiveness. The bottle is available in half-pint and pint sizes.

Science News Letter, December 29, 1956

WEATHER SEAL for service entrance mast installations on roofs makes caulking unnecessary. The plastic neoprene unit seals

out moisture and absorbs vibration. The unit contains a seamless base of aluminum, copper, lead or zinc-plated steel. The neoprene seal fits the base snugly.

Science News Letter, December 29, 1956

HUMIDITY DETECTOR determines moisture conditions in sealed packages without breaking the seals or packages. The electrical humidity detecting system can be used for military and industrial packs where contents must be protected from corrosion. No special training is necessary to use the device.

Science News Letter, December 29, 1956

SIGNAL AUTO LIGHT for highway safety when motorists are forced to stop provides a blinking red and yellow flash. The cord is plugged into the cigarette lighter socket and the light automatically flashes on and off. It can be put on any part of the stopped car by means of a rubber suction cup.

Science News Letter, December 29, 1956

TRANSISTORIZED PA SYSTEM is built into an attache case. Weighing 18 pounds, the portable public address system can be carried like luggage and is powered by two flashlight batteries. It consists of a Hi-Fi transistor amplifier, a heavy-duty eight-inch speaker, a microphone and controls.

Science News Letter, December 29, 1956



Nature Ramblings



By HORACE LOFTIN

► **COLD WINTER** has robbed the crown of the king of our temperate forests, the white oak, *Quercus alba*. Only snow covers the stark branches of the sleeping monarch.

Winter nakedness, however, helps to reveal the regal bearing of the white oak. See—as you could not in summer—how the great branches emerge almost at right angles from the sturdy trunk. See the magnitude of the branches.

These branches give the white oak the greatest spread of any trees of our woods.

If you could look underground at the root system of the white oak, you would see a taproot that almost rivals the trunk in size and lateral roots to match the branches in length and complexity.

White oaks become gigantic in size and hoary with age. There is, for instance, an ancient oak at Fairlee, Md., that measures 24½ feet around its trunk, is 118 feet tall and has a spread of 127 feet.

Forest Monarch



Testifying to great age is another great white oak standing in the Friends cemetery at Salem, N. J., under whose shade the Quakers and Indians signed a peace treaty in 1675.

The first leaves of spring to emerge from the awakening monarch's winter buds are vivid red, bringing brightness to the forest. This red then turns to pink and finally to the typical silvery white crown of the

white oak. These deeply lobed leaves are five to nine inches long and two to four inches wide. Their upper surface is shining and hairless, while the lower surface has a whitish bloom.

About the time of the unfolding of the leaves, male flowers on drooping tassels add a share of color. The female flowers are quite inconspicuous.

Acorns begin to develop in early spring, at first with three seeds in each. Later, two of these disappear by being absorbed, so that each ripe acorn represents a single seed.

Acorns of the white oak mature in a single season. Acorns of the red oaks take two years for maturation, being only minute "baby acorns" during their first season.

White oak acorns are from ¾ to 1½ inches long and are shiny brown. They can be told from red oak acorns by examining the inner surface of the acorn shell. In the white oaks, this surface is smooth; in the red oaks, it is lined with wooly hairs.

Science News Letter, December 29, 1956